CLAIMS

1. An optical amplifier comprising:

an amplification medium for amplifying wavelength-division-multiplexed (WDM) light;

a measurement part for measuring either input optical power of said WDM light on an input side of said amplification medium or output optical power of said WDM light on an output side of said amplification medium, or both of them;

a variable gain equalizer connected on a transmission line and capable of variably setting a passing-wavelength characteristic;

a database for holding at least data representing wavelength characteristics that respectively correspond to transmission line types;

an arithmetic part for computing an inverted passing-wavelength characteristic resulting from a passing-wavelength characteristic of said variable gain equalizer, based on an acquired transmission line type, said optical power measured by said measurement part, and said data held in said database; and

a setting part for setting a passing-wavelength characteristic of said variable gain equalizer, based on said inverted passing-wavelength characteristic computed by said arithmetic part.

2. An optical amplifier comprising:

an amplification medium for amplifying wavelength-division-multiplexed (WDM) light;

a measurement part for measuring either input optical power of said WDM light on an input side of said amplification medium or output optical power of said WDM light on an output side of said amplification medium, or both of them;

a variable gain equalizer connected on a transmission line and capable of variably setting a passing-wavelength characteristic;

a database for holding at least data representing wavelength characteristics that respectively correspond to transmission line types;

an acquisition part for acquiring the transmission line type used;

an arithmetic part for computing an inverted passing-wavelength characteristic resulting from a passing-wavelength characteristic of said variable gain equalizer, based on the transmission line type acquired by said acquisition part, said optical power measured by said measurement part, and said data held in said database; and

a setting part for setting a passing-wavelength characteristic of said variable gain equalizer, based on said inverted passing-wavelength characteristic computed by said arithmetic part.

3. The optical amplifier as set forth in claim 1, wherein said measurement part measures a power of excitation light on the input side of said amplification medium.

4. The optical amplifier as set forth in claim 1, wherein said database further holds information about a transmission line length connected to said amplification medium.

5. The optical amplifier as set forth in claim 1, wherein:

said database holds wavelength characteristics respectively corresponding to the input optical power and output optical power of a centralized amplification type transmission line; and

said arithmetic part is constructed to compute said inverted passing-wavelength characteristic, based on said wavelength characteristics corresponding to said input optical power and output optical power held in said database.

6. The optical amplifier as set forth in claim 5, wherein said arithmetic part is constructed to compute said inverted passing-wavelength characteristic so that gain of said centralized amplification type transmission line is constant.

7. The optical amplifier as set forth in claim 4, wherein said arithmetic part is constructed to compute said inverted passing-wavelength characteristic, based on data causing the number of multiplexed wavelengths and a wavelength characteristic due to a stimulated Raman scattering effect to correspond to each other.

8. The optical amplifier as set forth in claim 4, wherein said acquisition part is constructed to obtain at least either information about a type of transmission line connected to said amplification medium or information about a length of said transmission line, from either monitoring light from an upstream side of said transmission line or a device monitoring system that monitors a status of transmission.

9. The optical amplifier as set forth in claim 1, wherein:

said database holds a wavelength characteristic corresponding to a power of excitation light of a transmission-line amplification type transmission line; and

said arithmetic part is constructed to compute said inverted passing-wavelength characteristic, based on said wavelength characteristics respectively corresponding to said power of excitation light held in said database and said output optical power measured by

said measurement part.

10. The optical amplifier as set forth in claim 1, wherein:

said arithmetic part is constructed to compute said inverted passing-wavelength characteristic, based on said data representing wavelength characteristics that respectively correspond to transmission line types, contained in light received from a first direction side and provided on said first direction side, and based on the number of multiplexed wavelengths contained in light received from a second direction side; and

said setting part is constructed to set a passing-wavelength characteristic of a portion in the first direction side of said transmission line.

11. The optical amplifier as set forth in claim 1, wherein:

said amplification medium employs a centralized amplification type transmission line to amplify WDM light; and

said setting part is constructed to set said passing-wavelength characteristic, based on input optical power and output optical power of said centralized amplification type transmission line, after said variable gain equalizer has been booted.

12. The optical amplifier as set forth in claim 1, wherein:

said amplification medium employs a Raman amplification type transmission line to amplify WDM light; and

said setting part is constructed to set said passing-wavelength characteristic, based on power of excitation light of said Raman amplification type transmission line, after said variable gain equalizer has been booted.

13. The optical amplifier as set forth in claim 10, wherein:

said arithmetic part is constructed to compute said inverted passing-wavelength characteristic for said first direction side, based on the data contained in received light; and

said setting part is constructed to set the inverted passing-wavelength characteristic to a portion in the first direction side of said transmission line, based on the data held in said database.

14. The optical amplifier as set forth in claim 10, wherein:

said arithmetic part is constructed to compute said inverted passing-wavelength characteristic for said first direction side, based on the first data from the

self-station; and

said setting part is constructed to set said inverted passing-wavelength characteristic to a portion in the first direction side of said transmission line, based on second data held in said database.

15. A passing-wavelength characteristic control method in an optical amplifier, comprising the steps of:

measuring either input optical power of WDM light on an input side of an amplification medium that amplifies said WDM light, or output optical power of said WDM light on an output side of said amplification medium, or both of them, by a measurement part connected to said amplification medium;

acquiring a transmission line type by an acquisition part connected to said measurement part;

computing an inverted passing-wavelength characteristic of a variable gain equalizer connected on the transmission line and capable of variably setting a passing-wavelength characteristic by an arithmetic part connected to said measurement part, based on said optical power measured at said measurement part, the acquired transmission line type, and at least data, held in a database, which represents wavelength characteristics that respectively correspond to transmission line types; and

setting a passing-wavelength characteristic of said variable gain equalizer, based on said inverted

passing-wavelength characteristic computed at said arithmetic part, by a setting part connected to said arithmetic part.

16. An optical transmission system comprising:

a transmission line for transmitting an optical signal; and

an optical amplifier for amplifying wavelength-division-multiplexed (WDM) light that is transmitted through said transmission line,

wherein said optical amplifier comprises

an amplification medium for amplifying said WDM light,

a measurement part for measuring either input optical power of said WDM light on an input side of said amplification medium or output optical power of said WDM light on an output side of said amplification medium, or both of them,

a variable gain equalizer connected on said transmission line and capable of variably setting a passing-wavelength characteristic,

a database for holding at least data representing wavelength characteristics that respectively correspond to transmission line types,

an arithmetic part for computing an inverted passing-wavelength characteristic resulting from a passing-wavelength characteristic of said variable gain

equalizer, based on an acquired transmission line type, said optical power measured by said measurement part, and said data held in said database, and

a setting part for setting a passing-wavelength characteristic of said variable gain equalizer, based on said inverted passing-wavelength characteristic computed at said arithmetic part.